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The impact of a community –based food skills intervention on dietary intake and factors influencing food choice

WENDY L. WRIEDEN[1]
ANNIE S. ANDERSON[1]
PAT J. LONGBOTTOM[1]
KAREN VALENTINE[1]
MARTINE STEAD[2]
MARTIN CARAHER[3]
TIM LANG[3]
BILL GRAY[4]
ELIZABETH DOWLER[5]

[1]*Centre for Public Health Nutrition Research, University of Dundee, Ninewells Hospital and Medical School, Dundee DD1 9SY,*
[2]*Institute for Social Marketing, University of Stirling and Open University, University of Stirling,* FK9 4LA
[3],*Institute for Health Sciences, City University , London, UK*
[4]*The Scottish Community Diet Project, c/o Scottish Consumer Council, Royal Exchange House, 100 Queen Street, Glasgow, G1 3DN*
[5]*Department of Sociology, University of Warwick, Coventry CV4 7AL*

Running title : Impact of a food skills intervention

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Abstract
Objective: To assess the impact of a community-based practical food skills intervention (CookWell) in low-income communities on food intake, food preparation methods and cooking confidence.

Design and Setting: A 7 d food diary was used to assess changes (deltas) in diet, while confidence in cooking and methods of food preparation were assessed using a questionnaire self-administered pre-(T1), immediately post-intervention 2 months later (T2), and 6 months (T3) later.

Subjects: Eighty-four women and 9 men allocated to intervention (n= 51) and control (n=42) groups.

Setting: Eight low-income urban communities in Scotland UK

Results: In total fifty subjects completed 7 d food diaries at both T1 and T2; 41 completed diaries at both T1 and T3. Consumption of fruit was very low (mean, two portions per week) but the change (delta T2-T1) in fruit intake in the intervention group was significantly different from that in the control group. Increases for vegetables and salad intake in the intervention group compared to the control group were not significantly different. Intakes of fish, and rice and pasta were unchanged. No significant differences were observed in the T3-T1 deltas.
Between T1 and T3 there was a significant increase, from 67% to 90%, in the percentage of intervention subjects reporting confidence in following a recipe ($P<0.05$). In contrast, the delayed intervention group showed no increase in confidence over the same period

Conclusions: The food skills intervention had a small, immediate beneficial impact on participants' diets that was not sustained, and this was accompanied by more lasting impact on participants' confidence that in time may assist dietary change.

Keywords: Food skills, cooking confidence, dietary intake

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Introduction

A diet rich in starchy carbohydrates, fruits and vegetables and low in fats (especially saturated fats) is likely to delay the development of the major causes of morbidity and mortality (namely coronary heart disease, strokes and cancer, obesity, non-insulin dependant diabetes and dental decay).[1-3] Achieving dietary change in the entire population presents a major public health challenge, but particularly so in low-income households where the contribution of nutrition to inequalities in health has been well described.[4-8]

For many socially disadvantaged families, practical issues restrict attaining a healthy varied diet. These include ready access to affordable food items, limited disposable income, cooking facilities and cooking skills combined with family preferences and misconceptions about current dietary guidelines. A number of studies[7] suggest that, in addition to personal social disadvantage (e.g. socio-economic status) poor neighbourhoods provide fewer opportunities for health promoting activities than more affluent communities. In low income households, domestic food preparation is often reported to play a key part in balancing household budgets.[7] Dowler *et al.*[9] have demonstrated that lone-parents who "*regularly cooked from fresh or raw ingredients…achieved healthier dietary variety for themselves and their children*". However confidence in cooking techniques is strongly related to income and social class[10] with a higher percentage claiming confidence in techniques such as boiling, steaming, grilling and oven-baking in the high as opposed to low-income groups.

The relationship between food skills and dietary intake has not been studied in any systematic manner in adults. One study showed that cooking skills were positively associated with vitamin C, fruit and vegetable intake and negatively associated with convenience food consumption[11] and a more recent study has shown that boys, but not girls (aged 11-12 years from a deprived social background) significantly increased their fruit and vegetable consumption following a 20-week after-school food skills club.[12] Evaluation reports of studies from Glasgow, Grampian and Leicester have reported changes in eating habits and increased vegetable and fruit consumption amongst adult participants in food skills classes.[13-15] However the impact of interventions to improve food preparation skills on dietary and cooking confidence has not been studied in detail. In many areas of social disadvantage, local food skills projects such as '*Get Cooking!*[16,17] and national campaigns as run by the Royal Society for the encouragement of Arts (RSA)[18, 19] have developed to address barriers to progressing dietary change. These vary in success, but community ownership (where local people are regarded as equal partners) has been described as a key feature and an important factor in the design of projects targeted at disadvantaged communities.[7] It is recognised that dealing with any one barrier to dietary change is unlikely to radically alter dietary behaviour, that will have developed over a lifetime, but pilot studies suggest that food skills interventions may be a useful starting point for initiating dietary change. They may lead on to the development of other issues such as self-esteem or community capacity to develop and tackle the food supply in an area.[15, 20, 21]

Martin's references – still cannot find 2 out of the 3 (Martin can add text and ref in appropriate place – you suggested Macario et al and Wickett. Don't think it will matter if they are not here but didn't want to add with out reading) WENDY GO AHEAD BUT THINK WE SHOULD ADD

JONSSON, I.M., EKSTRÖM, M.P. and GUSTAFSSON INGA-BRITT (2005) Appetizing learning in Swedish comprehensive schools: an attempt to employ food and tasting in a new form of experimental education. International Journal of Consumer Studies, 29, 1, 78–85. *In your resource pack.* EVEN THOUGH IT IS ABOUT SCHOOLS.

WENDY I THINK THAT WE SHOULD REFLECT THE DEBATES OVER SKILLS VERSUS STRUCTURES AS FOLLOWS (FROM SOMETHING THAT LIZ AND I HAVE WRITTEN) BUT CHANGE AS YOU FEEL

THE DEBATES OVER FOOD POVERTY ARE SPLIT BETWEEN THOSE WHO FAVOUR A STRUCTURALIST [1](ACCESS, AFFORDABILITY AND AVAILABILITY) AND THOSE WHO FOCUS ON INDIVIDUAL CHOICE FACTORS [2] [3] [4] (AWARENESS AND ACCEPTABILITY). THIS IS A CRUDE DIVIDE AND FOOD CHOICES ARE CLEARLY A FUNCTION OF WIDER STRUCTURAL ISSUES MEDIATED NOT ONLY BY PERSONAL TASTES AND CULTURAL BELIEFS BUT ALSO THROUGH PUBLIC AND PRIVATE SECTOR POLICIES, RESPONDING TO FINANCIAL CLOUT AND MARKET FORCES. THE FOLLOWING ILLUSTRATION OF FRUIT CONSUMPTION DEMONSTRATES HOW SOME OF THESE COLLIDE AND INTERACT.

The 2004 audit of Community Food Initiatives in Scotland[22] lists 309 initiatives, of which at least 80 include a cookery skills component. For some this will be their primary task but for many others a secondary activity (e.g. a community cafe that runs occasional cooking skills classes). However, the overall impact of practical food skills interventions on dietary intake, changes in shopping and eating behaviour and food costs have to date ~~never~~ NOT been systematically assessed and are required to present an evidence base for cost-effective AND EFFICIENT work in this arena. The reported work combined the experience of previous food skills work and materials (e.g. National Food Alliance Get Cooking[16]) to develop and evaluate a cookery skills intervention in areas of urban social disadvantage.

The overall aim of the study was to develop and **assess the impact of a community-based practical food skills intervention (CookWell) in low-income communities.**

Methods

Overview

A standardised programme was designed and implemented in 8 community-based settings in Scotland UK. Pre-, post-intervention and 6 month follow-up measures were carried out in intervention and delayed intervention/control subjects.

[1] Robinson N, Caraher M and Lang T (2001) Access to shops; the views of low income shoppers *HEJ* 59, (2), 121-136.

[2] Cummins S and MacIntyre S 2002 Is Government Health Policy Based on Evidence or Assumption? ("Food deserts" - evidence and assumption in health policy making) http://bmj.com/cgi/content/full/325/7361/436 BMJ 325, 436-438 (24th August).

[3] Dibsdall L.; Lambert N.; Bobbin R.; Frewer L. (2003*)* Low-income consumers' attitudes and behaviour towards access, availability and motivation to eat fruit and vegetables *Public Health Nutrition*, April 2003, vol. 6, iss. 2, pp. 159-169(11).

[4] Dibsdall LA, Lambert N, Frewer LJ. (2002) Using interpretative phenomenology to understand the experiences of a low income group of UK women towards aspects of food choice and health. *J. Nutr. Educ*. 2002; 34: 298–309.

Consultation with potential participants in two of the communities, community workers, and reviews of existing reports and manuals used in previous community food preparation classes led to the development of a standard but flexible intervention (CookWell) combining practical cooking with encouragement to consume key foods (particularly fruit, vegetables and starchy carbohydrates).

~~The intervention was implemented in 8 communities.~~ **ALREADY SAID ABOVE WHERE I HAVE INCLUDED 8.** Quantitative evaluations using food diaries, shopping diaries and questionnaires were carried out in intervention and delayed intervention (thereafter called control) subjects at baseline (T1), immediately after the intervention 2 month later (T2), and 6 months later (T3). Qualitative interviews were also carried out at T3 in a sample of intervention subjects and a small sample of control subjects. This paper reports the results of the dietary assessment and REPORTED measures of confidence in food preparation.

Recruitment of subjects

~~Eight community groups were successfully recruited through the Scottish Community Diet Project and groups already known to the project team~~. Enquiries from interested groups were initially made to the Project leader who explained the project and THE FOLLOWING WERE USED AS INCLUSION CRITERIA AND OUT OF X APPROACHED 8 WERE INCLUDED WHO MET THE FOLLOWING CRITERIA ~~then asked whether the community project had potential to meet the following criteria:~~

- Recruitment of approximately 20 subjects
- Kitchen/food preparation facilities for approximately 10 people
- Ability to timetable a 2-3 hour group for 10 weeks between October 2000 and June 2001
- The project served a low-income area and was situated in an urban environment

Visits were then made to the various sites to assess the premises and to discuss arrangements for equipment, crêche, tutor and recruitment. It was explained that it was necessary to recruit a group of people within the area who were all interested in improving their food skills but that half the group would be asked to delay their participation in the CookWell practical course for 8 months in order to form a control/delayed intervention group for comparison.

Development of the CookWell Programme.

The aim of the intervention was to increase consumption of fibre-rich starchy carbohydrates, fish, vegetables and fruit and decrease in consumption of fat in adults living in areas of deprivation. The development of the programme was informed by results from focus groups with prospective participants in two of the communities (reported elsewhere[27]). Respondents expressed interest in the content of the programme focussing on soups and budget cookery with practical aspects of fish and vegetable preparation being less desirable. Using this information a CookWell manual was designed to enable facilitators to follow a standardised, but flexible, programme in each community. Attention was given to the use of basic foods (e.g. rice, pasta, potatoes) with simple but innovative ways to achieve dietary balance, and variety through additions such as herbs and spices and the use of ethnic recipes where desired. A protocol for the organisation and delivery of the CookWell programme was designed, and included in the facilitator's pack, so that dietary objectives were identified and facilities, resources, crêche and food-safety issues were clearly addressed.

Implemention of the CookWell programme

~~During the period 2000-2001, the CookWell programme was run in 8 locations throughout Scotland.~~ REPEAT OF ABOVE? The overall design of the implementation phase was a between intervention and control subjects, repeated measures design, with 3 time-points of data collection i.e. at baseline and 2 and 6 month intervals: pre intervention (T1), at the end of the intervention main phase (T2) and 6 months (T3) after end of intervention.

The intervention was designed to take place over 10 weekly 2 hour sessions and involved both practical and educational elements (Table 1). In weeks 1 and 10, participants assembled for data collection. In week 2 everyone took part in an informal educational session, and returned baseline food diaries. Participants divided into teams and covered topics such as food hygiene, nutrition and food tasting using interactive question and answer sessions. All participants (control and intervention) were provided with this education programme at the start of the intervention. The practical sessions for the control group were run at a later date after the final dietary assessment (T3) for the main project.

Evaluation of the CookWell Programme

All assessment tools were drafted and piloted in a community group not involved in the main study BUT WERE THEY OFFERED OR DID THEY DO A SERIES OF CLASSES? . Some changes were made to the questionnaires where it was deemed necessary e.g. a question had been misinterpreted. The methods outlined here follow those described by Dowler *et al*[9] in their study of lone parent families. At each measurement time (T1, T2 and T3), all subjects were asked to complete the following assessment tools:

- GENERAL INTERVIEW QUESTIONNAIRE included closed questions on the socio-demographic details of the family; family mealtimes; frequency of eating out and buying 'takeaways'; cooking information e.g. what kind of meals are prepared and what type of cooking information would be useful and food shopping behaviour.
- COOKING SKILLS QUESTIONNAIRE was used to assess changes over time with reference to family meals; confidence in cooking certain foods and techniques and following a recipe; kitchen equipment; factors influencing food choice and shopping behaviour; addition of salt and frequency of eating fish, fruit and vegetables. This questionnaire was based on that used in previous work[10,23]
- FOOD DIARIES to record estimated dietary intake for 7 days for all members of the family.
- FOOD FREQUENCY QUESTIONNAIRE (FFQ) was used as a cross-check for the 7-day food diaries and was completed when the food diaries were collected. The frequency of eating a total of 71 foods was recorded, 27 of those specifically concerning fruit and vegetables. The questionnaire was developed and refined from questionnaires used in National surveys such as the Scottish Health Survey and the National Diet and Nutrition Surveys [24,25, 26]

A pack of cooking utensils (including for example a saucepan, cheese grater, knifes) was provided for each participant (intervention and controls) as an incentive for completing the T2 assessments. By providing this pack for both intervention and control subjects lack of equipment could be eliminated as a reason for not cooking. To aid the return of the T3 assessments a £10 voucher was provided for the written assessments

Analysis and interpretation of data

Analysis of questionnaire and diary data was carried out to assess changes in the following between T1, T2 and T3:

- Frequency of consumption of key foods (fruit, vegetables and salads, fruit and vegetables, total fish, tuna, total bread, pasta and rice) and changes. This was standardised by comparing information from diaries completed for 7 days at both time points of comparison.
- Frequency of key food preparation and cooking methods as indicated by answers to questions on the kind of cooking carried out (cooking from basic ingredients, cooking convenience foods), salt added during cooking, as well as frequency of consumption of fried/roast potatoes and boiled/baked potatoes from food diaries and changes.
- Confidence in cooking selected items, following a recipe and using basic ingredients was reported and changes in frequency of those expressing confidence from T1, T2 andT3. Confidence was rated on a 4 point scale from 'Very confident' to 'Not at all confident' with an additional category of 'Don't Know'. For the purpose of analysis confidence categories were merged such that very confident and quite confident became confident and not very confident, not confident at all and 'don't know' became 'not confident or don't know'.

Statistical Analysis

The magnitude of changes between these time points (T2-T1 and T3-T1) were compared between intervention and control/delayed intervention groups using the Student t–test. Changes in frequency categories (e.g. cooking confidence, use of salt) over T1, T2 and T3 were analysed using the Chi-square test in intervention and control/ delayed intervention groups. Only subjects who had completed measurements at both comparative points were included in this statistical analysis of differences.

Results

Recruitment and response rates

A community worker ATTACHED TO COOKWELL?? carried out recruitment in each of 8 communities. The number initially recruited in the communities varied but in each community at least 11 subjects were recruited and at least 5 completed the general interview questionnaire. Every participant did not complete all the components at each measurement time. Of the 113 originally recruited who completed the general interview questionnaire, 20 were considered to be 'withdrawals' having, in general, completed only the initial interview and food and cooking skills questionnaires. The remaining 93 comprised 51 intervention and 42 controls/delayed intervention.

At T3 a total of 63 (36 intervention and 27 controls) completed the interview questionnaire but some did not do the other assessments. The response to each component varied at each measurement time despite efforts both by researchers and community workers to ensure maximum response. The reasons for this were multiple and included

- inability to attend assessment sessions;
- illness,
- onerous nature of the study. (reason at T1)
- employment,
- moving out of the area

- change in circumstances e.g. other commitments (especially relevant at T3);
- loss of interest after second measurement time when cooking sessions completed
- loss of questionnaires returned by post.

Socio-economic details of participants

The number of female participants at T1 far outnumbered the males, being 100 (88%) to 13 (12%). The mean age of all groups was similar with an overall mean age of 32.3 (SD, 10.2) years and an age range of 16 to 65 years at T1. In addition:

- Half of all participants smoked (47%).
- Just under half had incomes of less than £150 per week and
- Only 4% of participants were employed full-time
- 14% were in part-time employment.
- The majority (77%) of participants finished their full-time education at 16 years or below, the intervention group having the highest percentage (84%) in this category.
- Thirty-two percent of participants had no formal qualifications.

(I have cut this from original report – could it be cut even more – the purpose is simply to get across that the participants were low-income with few educational qualifications – Annie's suggestion of doing a table showing intervention and control and significant differences in character is probably irrelevant as the socioeconomic details of the participants given here are for the group that was recruited. To give the socioeconomic characteristics at T1 T2 and T3 just makes things too complicated. Bullet points are Martin's idea). MAYBE PUT IN MARTINE'S POINT HERE FROM THE QUALITATIVE INTERVIEWS WE WERE AWARE THAT MANY LED ;CHAOTIC' LIVES WITH A HIGH DEPENDENCY ON BENEFITS ETC.

Frequencies of consumption of key foods

Only complete 7-day diaries were used in the calculations and the differing numbers of subjects completing both T1 and T2 diaries and both T1 and T3 diaries resulted in slight differences in the overall frequencies reported at T1. Full results are given in Tables 2 and 3. In summary mean frequencies of consumption at baseline were:

- Fruit (including fruit juice) was 2-3 times a week being slightly higher in the control/delayed intervention group.
- Vegetable and salad consumption amounted to 6 times a week in the intervention group and 7 in the control/delayed intervention group.
- Fish was consumed a mean of once a week with tuna constituting approximately one-third to a half of this.
- Starchy foods (a total of bread, potatoes (non-fried), pasta, rice and breakfast cereal) were consumed an average of 17 times a week with bread constituting 10, and pasta and rice 2, of these occasions.) -

Annie says this section was difficult to read and repeats the table – I have rounded the figures in the table and bulleted.

At T2 a mean change equivalent to one portion a week was seen in the intervention group at T2 for fruit (P=0.047), fruit and fruit juice (P=0.11) but no other significant changes were seen. This change was not sustained and the mean frequency of consumption of fruit at T3 was similar to baseline levels. There were no significant differences in the changes (T3-T1) when intervention were compared with control/delayed intervention subjects

Food preparation and cooking methods
The numbers and percentage of subjects reporting positive responses to a range of questions to do with key food preparation methods are given in Table 4. Results show that the percentage of people cooking from basic ingredients increased non-significantly in the intervention (P=0.091) but not in the control/delayed intervention group (P=0.675). There were no significant differences in the proportions reporting that they assembled meals from ready made ingredients (e.g. pasta and ready made sauce), used convenience foods or added salt during cooking in either control/delayed intervention or intervention subjects across the three time points.

Data from food diaries suggested that there was no change in cooking methods for potatoes. Weekly frequencies of consumption (Martin – no distinction in home or take aways in food frequency or data recorded from diary – unlikely that this level of detail recorded) were between 2 and 3 times for fried potatoes and 2 to 2.5 times for the non-fried variety. There was very little or no change from T1 to T2 or T1 to T3 and differences between control/delayed intervention and intervention groups were not significant.

Cooking confidence
Table 5 and Figure 1 show the changes in confidence ratings for a range of cooking skills. There was a significant increase in the proportion of intervention subjects reporting confidence in following a recipe over the 8 months of the project, this confidence being maintained at T3. A higher percentage of intervention subjects reported confidence in cooking from basic ingredients, cooking lentil soup and white sauce at T2 and T3 (P values approached significance). No other changes in the responses to cooking confidence questions were reported. For example, there was no change in confidence with regards to cooking rice but over 80% of subjects expressed confidence in cooking this commodity at baseline.

Discussion

Recruitment
It was originally intended that 10 participants per community (with a minimum of 6 participants finishing the programme) and a similar number of control/delayed intervention subjects would be recruited. However, in practice, it was not possible to recruit 20 subjects initially and randomly allocate half to the intervention with the other half serving as the comparison or delayed intervention group. Some recent work carried out in Wales has confirmed findings that facilities in the community were not normally large enough to provide for 10 participants and six or less is a much more manageable number for the food skills courses in terms of both premises and tutoring.[17] In addition participants who initially expressed an interest in the classes were unable to turn this interest into a commitment to attend and/or complete the assessments. The final numbers for comparison of changes in food frequencies calculated from the food diaries was thus reduced to 29 intervention and 21 controls for the T1 to T2 comparison and 24 intervention and 17 controls for the T1 to T3 comparison. A bigger study would have allowed greater power to select/IDENTIFY? changes.
AS WITH MOST DISADVANTAGED GROUPS THE BARRIERS TO CHANGE WEE MULTIPLE ALA DOWLER'S LONE PARENT SURVEY. SO WHEREAS INDIVIDUALS EXPRESSED INTEREST AND COMMITMENT (AND THERE WERE CHANGES IN KNOWLEDGE) TO CHANGE THE OTHER FACTORS MILITATED AGAINST THE ACHIEVEMENT OF SUCH CHANGES IN THE DAILY STRUGGLE OF JUGGLING. I

SUPPOSE I WONDER EVEN WITH A BIGGER SAMPLE ALL YOU PICK UP IS THIS TENSION/STRUGGLE AS OPPOSED TO CHANGES??

Annie do you want to amend this further in the light of your comments??

Evaluation of dietary changes

Several measures were used to evaluate food and dietary intakes in this study such that any changes could be monitored from baseline to T2 and T3. Participants were asked to keep food diaries for themselves and the family for 7 days. For simplicity only the intake recorded for the actual participants themselves are reported here. The only significant change detected from the food diaries were in fruit (excluding fruit juice) consumption in the intervention group from T1 to T2 and this change equated to an increase of one portion of fruit per week on a baseline level of approximately two portions per week. Vegetable consumption as recorded showed a change of less than half a portion on a baseline of 6 portions per week so overall the increase in **daily** total fruit and vegetable consumption changed from just over one portion to just less than 1.5 portions. I CANNOT RECONCILE THIS WITH THE DATA ON PAGE 8 RE 'At T2 a mean change equivalent to one portion a week was seen in the intervention group at T2 for fruit (P=0.047), fruit and fruit juice (P=0.11) but no other significant changes' IT MAY JUST BE ME BUT THERE SEEMS TO BE A DISCREPANCY BETWEEN WHAT IS BEING SAID HERE AND THIS DATA FROM P8?

At T3, 6 months after completion of the CookWell course no significant differences in the changes (T3-T1) in the frequency of consumption of key foods were seen when intervention and control subjects were compared. Fruit consumption was similar to baseline as was overall fruit and vegetable consumption. Food frequency questionnaires administered as a cross check showed no significant differences between time points but confirmed the low fruit and vegetable consumption in this low-income group with over three quarters of subjects recording a less than daily (around 50%) or no consumption of fresh fruit (approximately one quarter). The quantities of fruit and vegetables eaten are considerably less than the recommended 5 portions per day[28] but are similar to that seen for women of manual social class in the Scottish Health Survey[5] where less than half claimed daily fruit consumption.

Results from the MONICA study in north Glasgow in 1995 showed that only 12% of women in the most deprived quarter (as measured by postcode) consumed fruit and vegetables 4 times a week and that despite an general increase in fruit and vegetables in the population over the previous ten years there had been little change in the most deprived group.[29] Thus overcoming barriers to increasing fruit and vegetable consumption will require a sustained effort and a variety of methods. The work described here showed that cooking skills classes make a small measurable change in dietary habits but this was not maintained when the encouragement to cook and eat these key foods was withdrawn. THE HEALTH PROMOTION LITERATURE DESCRIBES A SIMILAR PROCESS OF REGRESSION ONCE A PROGRAMME IS WITHDRAWN KENNEDY (2001) IN A REVIEW OF A PAN-EUROPEAN NUTRITION PROGRAMME IN LOW INCOME HOUSEHOLDS CONCLUDES THAT APPROACHES WHICH RESPONDED BY TEACHING PEOPLE SKILLS TO COPE WITHIN THEIR EXISTING RESTRICTED CIRCUMSTANCES ARE LIMITED IN THEIR ABILITY TO CHANGE BEHAVIOUR, THEY NEED TO BE LOCATED WITHIN A WIDER FRAMEWORK OF MULTI-AGENCY WORKING DESIGNED TO DEVELOP CAPACITY BUILDING AND CHANGE LOCAL SETTINGS TO ENSURE SUSTAINABILITY OF IMPACT TO OUTCOME MEASURES??

[Kennedy LA 2001 Community involvement at what cost? – local appraisal of a pan-European nutrition promotion programme in low income neighbourhoods. Health Promotion International, 16, (1), 35-

45]More sessions may have been needed to reinforce habits and may have served to decrease any misconceptions associated with 'healthy' eating. Although fish was not popular, either pre-intervention and after cooking and tasting in one of the sessions, an increase in the number of sessions would have allowed a greater variety of fish dishes to be included and the tasting of those dishes may have decreased the resistance to cooking and eating fish. Confidence in cooking unfamiliar foods may also have increased with greater exposure to cooking methods allowing those foods to become more prevalent in the diet when cooking at home. Annie - have added this yellow section in response to your comment.

Evaluation of changes in cooking methods and cooking confidence

The quantitative increase in the percentage of subjects reporting that they cooked from basic ingredients was confirmed by comments noted in the qualitative evaluations. [30] Hence many, but not all, participants reported that they were doing more cooking from basic ingredients and eating less convenience foods. This did not mean that convenience foods were being avoided altogether so it was not surprising that the quantitative results showed no change in the percentage of subjects cooking convenience foods. It was encouraging that the percentage of intervention subjects cooking from basic ingredients was higher six months after the intervention than at baseline or T2.

Confidence in cooking from basic ingredients was expressed by 90% of English women and 77 % English men surveyed in the 1993 Health and Lifestyle Survey.[10] The participants in the CookWell project represent a sample skewed towards the lower socio-economic section of society where confidence in using a range of techniques and cooking specific foods is expressed by a lower percentage of subjects. It was encouraging that the percentage of subjects expressing confidence in cooking following a recipe and cooking certain dishes increased amongst intervention but not amongst control/delayed intervention subjects. Comments from the qualitative work about increased confidence in these areas confirmed this result. To our knowledge there is only limited evidence[17] to date that cooking skills classes increase cooking confidence and it would be hoped that such confidence could overcome one of the barriers that prevent dietary change.

An increased improvement in food and cooking skills may have been limited by the number of sessions provided. Many of the participants were disappointed that the sessions were unable to continue due to lack of funds in the communities and put forward suggestions for other skills and dishes that would have been useful. PLANNING FOR Continuity OR LOCATION OR PROGRAMES WITHIN COMMUNITY NETWORKS IS ~~may be~~ ~~an~~ important factor in reinforcing skills that have been learned. THE HDA [Roe L Hunt H Bradshaw H and Rayner M 1997 Health Promotion and Effectiveness Reviews: Health promotion interventions to promote healthy eating in the general population. London, Health Education Authority.] IN A REVIEW OF THE LITERATURE IDENTIFIES THE FOLLOWING AS NECESSARY FOR EFFECTIVE DIETARY INTERVENTIONS:

- FOCUS ON DIET AND PHYSICAL ACTIVITY
- CLEAR GOALS NOT JUST THE PROVISION OF INFORMATION
- SUSTAINED PERSONAL CONTACT AND WORK WITH SMALL GROUPS OR INDIVIDUALS
- PERSONALISED FEEDBACK ON BEHAVIOUR CHANGE
- CHANGES IN THE ENVIRONMENT EG ENSURING COOKING FACILITIES ARE ADEQUATE IN THE HOME AND GIVING PEOPLE FACILITIES SUCH AS POTS AND PANS.
- SMALL SUSTAINABLE MODIFICATIONS IN BEHAVIOUR

Conclusion

The results of the assessments contribute to the evidence base on the contribution and value of food skills to healthy dietary choices at reasonable costs. The materials and methods used in the project have been further developed with a view to providing a simpler evaluation for all community food skills programmes.[31] The CookWell manual has been well received and using the feedback obtained from course leaders and participants a revised version has been produced [32] and made available to anyone who wants to get involved in cooking skills groups. Although the impact of the programme appears to be small in quantitative outcomes the research confirms that a practical food skills intervention can contribute to improving dietary choice. It is also likely that interventions of this type need to be ongoing and set alongside other measures to improve acceptability, affordability and access to food in low-income communities.

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Table 1 CookWell Intervention Timetable.

Week no.	Assessments	Intervention group	Control group
1	Baseline measurements for both groups.	Recruitment – allocation to intervention or control group.	
2	Return of 7-day food and shopping diaries and completion of FFQs for both groups.	Educational introductory session for all covering food hygiene, nutrition and food tasting.	
3		Cheese Sauce and Pasta Bake	
4		Soups and Scones	
5		Mince-based dishes	
6		Rice-based dishes	
7		Pizza and Salad	
8		Chicken Curry/Stew and Potato Wedges	
9	Participants sent T2 Food Skills questionnaire and food and shopping diaries	Carrot Cake and healthy puddings	
10	Collect T2 assessments.	End of session ‘celebration’ with snacks, presentation of CookWell certificates (for intervention group and cookery packs.	

Table 2 Mean (standard deviation) weekly frequencies of consumption from completed 7-day diaries for intervention (I, *n*=29) and control (C, *n*=21) groups T1 and T2 and mean change (T2-T1).

Commodity	Mean T1		Mean T2		Mean difference (T2-T1)		P value*
	I	C	I	C	I	C	(2-sided)
Fruit juice	0.10 (0.31)	0.48 (1.03)	0.35 (0.86)	0.81 (1.72)	0.24 (0.95)	0.33 (1.43)	0.79
Fruit (excluding fruit juice)	1.69 (2.36)	2.29 (2.90)	2.72 (3.28)	2.05 (2.94)	1.03 (2.26)	-0.24 (2.07)	0.05
Fruit and fruit juice	1.79 (2.34)	2.76 (3.42)	3.07 (3.65)	2.86 (4.05)	1.28 (2.55)	0.10 (2.51)	0.11
Vegetables and salads	5.97 (2.97)	7.05 (3.57)	6.41 (4.79)	6.62 (3.89)	0.45 (3.69)	-0.43 (4.96)	0.48
Fruit and vegetables	7.76 (4.26)	9.81 (5.64)	9.48 (7.11)	9.48 (5.11)	1.72 (4.71)	-0.33 (6.00)	0.18
Tuna	0.31 (0.85)	0.43 (0.68)	0.38 (0.73)	0.52 (0.87)	0.07 (1.07)	0.10 (1.00)	0.93
All fish	0.97 (0.98)	1.10 (1.00)	1.17 (1.36)	1.29 (1.06)	0.21 (1.21)	0.19 (1.17)	0.96
Total bread	10.21 (4.28)	10.05 (3.60)	9.28 (4.37)	10.67 (4.70)	-0.93 (4.53)	0.62 (4.73)	0.25
Pasta and rice	2.14 (1.41)	2.00 (1.67)	1.93 (1.75)	2.67 (1.93)	-0.21 (1.80)	0.67 (2.11)	0.12
All starchy foods	17.21 (5.59)	16.57 (5.90)	16.24 (6.35)	18.48 (5.85)	-0.97 (5.63)	1.90 (6.49)	0.10

* T-Test for equality of means. *P* value is for probability that difference in means is due to chance.

Table 3 Mean (standard deviation) weekly frequencies of consumption from completed 7-day diaries for intervention (I, *n*=24) and control (C, *n*=17) groups T1 and T3 and mean change (T3-T1).

Commodity	Mean T1		Mean T3		Mean difference (T3-T1)		P value*
	I	C	I	C	I	C	(2-sided)
Fruit juice	0.08 (0.28)	0.94 (1.78)	0.08 (0.28)	0.76 (1.68)	0.00 (0.29)	-0.18 (2.24)	0.75
Fruit (excluding fruit juice)	1.88 (2.75)	2.11 (2.71)	1.75 (2.58)	1.24 (1.52)	-0.13 (2.45)	-0.88 (2.29)	0.32
Fruit and fruit juice	1.96 (2.73)	3.06 (3.25)	1.83 (2.57)	2.00 (2.35)	-0.13 (2.42)	-1.06 (3.19)	0.29
Vegetables and salads	6.42 (3.31)	6.29 (3.70)	7.17 (4.57)	7.71 (5.67)	0.75 (3.12)	1.42 (2.85)	0.49
Fruit and vegetables	8.38 (4.95)	9.35 (5.41)	9.00 (5.46)	9.71 (6.95)	0.63 (4.06)	0.35 (4.61)	0.84
Tuna	0.38 (0.92)	0.35 (0.61)	0.33 (0.56)	0.76 (1.03)	0.04 (0.91)	0.41 (0.80)	0.10
All fish	1.17 (1.05)	0.94 (1.09)	1.33 (1.13)	1.00 (1.06)	0.17 (0.92)	0.06 (1.48)	0.78
Total bread	10.04 (4.76)	10.53 (3.64)	9.83 (4.49)	12.06 (3.51)	-0.21 (3.71)	1.53 (3.91)	0.16
Pasta and rice	2.21 (1.53)	1.88 (1.36)	1.67 (1.43)	2.35 (1.00)	-0.54 (1.91)	0.47 (2.13)	0.12
All starchy foods	17.04 (6.33)	16.76 (5.85)	17.08 (6.14)	18.88 (4.21)	0.04 (5.12)	2.12 (4.87)	0.20

* T-Test for equality of means. *P* value is for probability that difference in means is due to chance.

Table 4. Changes in percentage of subjects reporting use of key food preparation and cooking methods.

Cooking method	Intervention Group						
	T1		T2		T3		P value (2-sided)*
	n	%	n	%	n	%	
Cooking from basic ingredients (n=31)	21	68	23	74	28	90	0.091
Assembling ready-made ingredients (n=31)	17	55	18	58	19	61	0.876
Convenience foods (n=31)	20	65	21	68	21	68	0.953
Adding salt during cooking (n= 34)	17	50	15	44	19	56	0.629

Cooking method	Control Group						
	T1		T2		T3		P value (2-sided)*
	n	%	n	%	n	%	
Cooking from basic ingredients (n=20)	15	75	17	85	15	75	0.675
Assembling ready-made ingredients (n=20)	14	70	15	75	12	60	0.583
Convenience foods (n=20)	13	65	2	60	16	80	0.367
Adding salt during cooking (n=20)	3	15	6	30	7	35	0.437

* *P* values are for chi-square analysis for differences in proportions of subjects at each time point.
Numbers reported are for those who answered the same question at every time point.

Figure 1. The percentage of intervention and control subjects expressing cooking confidence at T1, T2 and T3.

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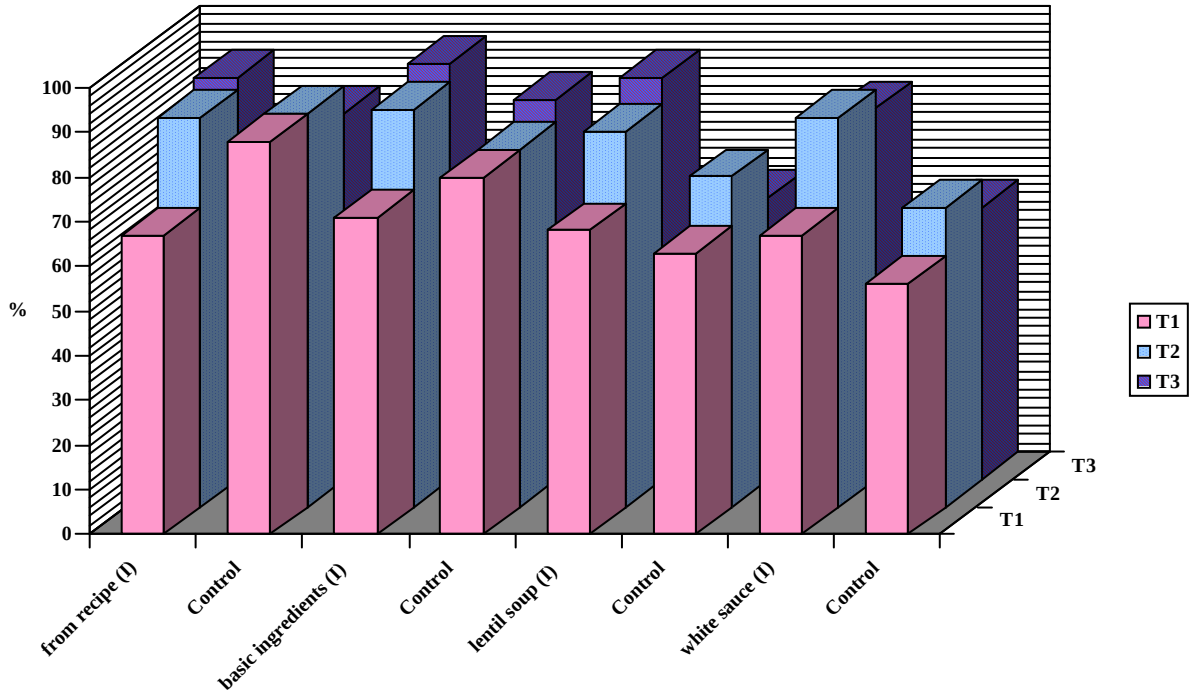

Table 5. Changes in percentage of subjects reporting cooking confidence for specific aspects at T1, T2 and T3.

Aspect of cooking	Intervention Group						
	T1		T2		T3		P value (2-sided)*
	n	%	n	%	n	%	
Following a recipe (n=30)	20	67	26	87	27	90	0.044
Cooking from basic ingredients (n=28)	20	71	25	89	26	93	0.060
Cooking lentil soup (n=31)	21	68	26	84	28	90	0.068
Cooking white sauce (n=30)	20	67	26	87	25	83	0.126

Aspect of cooking	Control Group						
	T1		T2		T3		P value (2-sided)*
	n	%	n	%	n	%	
Following a recipe (n=17)	15	88	15	88	14	82	0.847
Cooking from basic ingredients (n=20)	16	80	16	80	17	85	0.895
Cooking lentil soup (n=19)	12	63	14	74	12	63	0.729
Cooking white sauce (*n*=18)	10	**56**	12	**67**	11	**61**	0.792

* Chi-square test
Numbers reported are for those who answered the same question at every time point.